experience with theoretical knowledge is the most desirable method of producing young men qualified to take up responsible positions.

THE first annual conference of the Association of Teachers in Technical Institutions was held at the University of Leeds on May 22 and 23. The president, Mr. V. A. Mundella, of the Northern Polytechnic Institute, London, occupied the chair, and about one hundred delegates were present. Mr. Graham, secretary for higher education in Leeds, said that one of the great difficulties from an educational point of view, especially where it is wished to give students an all-round view of their particular calling, is that of the technical teacher teaching a bread-and-butter subject. If teachers could be convinced that it is absolutely necessary that the pupils should understand the scientific principles underlying that subject and get an all-round view of their particular trade, and not one particular little picture of it, a very great service would be done to technical education. In his presidential address, Mr. Mundella directed attention to the great leakage represented by the passing outside the pale of educational effort of children beyond the age of twelve, and he urged that up to the age of seventeen secondary education, widely diversified to meet local conditions, the standing of pupils, and the wishes of parents, should be made compulsory. There would thus be a perfectly natural development of the child. Scholarships, he said, do not meet the requirements, and grammar schools and public schools have no effect on the problem of secondary education, which is the provision of suitable schools for the 600,000 children who leave the present elementary schools. The examination system for scholarships is fundamentally wrong, besides being very expensive. It works out for the whole country at about 20*l.* per scholar on the average, a sum almost twice as great as would maintain the child in a provided secondary school belonging to the local authority. Mr. H. A. Clark, head of the engineering department of the Northern Polytechnic Institute, read a paper entitled "Notes of an Educational Visit to the United States." He referred to the brotherly feeling between English and American men of science, and described his journey through the States and the various institutions visited. Mr. Barker North, chairman of the West Yorkshire branch of the association, read a paper on the preliminary training of technical students. He condemned the preliminary training of students entering technical colleges as very inefficient, this being in the main due to the desire of educational committees to secure large classes, paying inadequate attention to the training of the students, and unmindful of the fact that it was better to produce six highly-trained men than six dozen inefficiently trained. A paper by Mr. J. Fitzgerald, of the South-Western Polytechnic Institute, and Mr. E. L. Bates, of the London County Council School of Building, Brixton, on syllabus and examinations as applied to building subjects, was read by Mr. Bates. At the outset Mr. Bates referred to the impossibility of one individual becoming proficient in more than one craft. He also dealt with the best course of technical instruction for the craftsman and the general foreman. Several discussions of an instructive kind followed the reading of papers.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society. February 14.—"On the Specific Inductive Capacity of a Sample of Highly Purified Selenion." By O. U. **Vonwiller** and W. H. **Mason.** Communicated by Prof. Threlfall, F.R.S.

The paper contains an account of the application of methods of measurement described by Pollock and Vonwiller (*Phil. Mag.*, June, 1902) to the determination of the specific inductive capacity of selenion. Two methods were employed, one an absolute electrometer method employing forces of a frequency of about fifty per second, and the other a resonance method employing electric oscillations of a frequency of 24 millions per second, which is believed to be more accurate than any high-frequency method hitherto employed. The selenion was cast into the form of a plate, 15 cm. diameter and 1 cm. thick, this plate being cast in such a manner as to ensure its being in the vitreous condition, after which it was ground with carborundum powder until the surfaces were flat and parallel. After each set of measurements the plate was broken up into small pieces, and the density of these pieces compared with that of the plate as a whole.

The following results were obtained:—

Density at 13°·8 C., 4·29.

Specific inductive capacity—by electrometer method, 6·13 at 16° C.; by oscillation method, 6·14 at 23°·6 C.

Specific resistance in the dark, approximate—between $2{\cdot}2\times10^{16}$ ohms at 20° C. and $6{\cdot}5\times10^{15}$ ohms at 25° C.

Resistance measurements were made in the dark, and it was noticed that the specific resistance fell considerably in the light as in the case of the conducting variety of selenion.

It was found that a thin reddish film forms on the surface of the selenion, though it is only exposed to air, and the comparatively high conductivity of this film gave considerable trouble before it was discovered.

February 28.—"The Enzymes associated with the Cyanogenetic Glucoside Phaseolunatin in Flax, Cassava, and the Lima Bean." By Prof. W. R. **Dunstan,** F.R.S., Drs. T. A. **Henry** and S. J. M. **Auld.**

The authors show there is reason to believe that these three plants, flax, cassava, and the lima bean, contain a mixture of the two glucosidolytic enzymes, emulsin and maltase.

The same authors had previously proved that the production of prussic acid from the lima bean, cassava roots, and the seeds or embryo plants of flax is due to the decomposition of the cyanogenetic glucoside, phaseolunatin (α-dextrose ether of acetone cyanohydrin), contained in each of these plants, by an enzyme which resolves this substance into acetone, dextrose, and prussic acid (Proc. Roy. Soc., 1902, lxxii., 285; 1906, lxxviii., 145; and *Ann. Chim. Phys.*, 1907 [viii.], 10, 118).

Since the mixture of enzymes obtained in the usual manner from any one of these three plants decomposes phaseolunatin and amygdalin, the characteristic glucoside of bitter almonds, whilst the enzyme which occurs with amygdalin in the almond decomposes amygdalin, but not phaseolunatin, it seemed clear that flax, cassava, and the lima bean must contain either a mixture of emulsin, with some other enzyme capable of hydrolysing phaseolunatin, or a new enzyme having the property of decomposing both glucosides.

Fischer's generalisation that the glucosidolytic enzymes so far systematically examined are divisible into two classes, the one capable of decomposing the α-alkyl ethers of the hexoses and the other the stereoisomeric β-alkyl ethers of these sugars, has rendered it possible to classify an unknown glucosidolytic enzyme by ascertaining whether it is active towards the α-alkyl ethers of the hexoses or towards the stereoisomeric ethers, and E. F. Armstrong has extended Fischer's work in this direction by showing that when the α-alkyl ethers of the hexoses are hydrolysed by enzymes of the maltase type the sugars immediately liberated are the α-forms, and that similarly the stereoisomeric β-ethers on hydrolysis by appropriate enzymes furnish the β-forms of the hexoses.

These methods have been applied to the investigation of the mixture of enzymes contained in these three plants and to the determination of the nature of the dextrose residue in phaseolunatin.

It was found that the mixture of enzymes has the property of hydrolysing amygdalin and salicin, which are both known to be β-glucosides, and similarly it decomposes α-methyl glucoside and maltase, which both have the α-structure.

Further, phaseolunatin is decomposed by yeast maltase and by the mixture of enzymes occurring with it in the three plants already named, yielding, in the first instance, the α-form of dextrose, so that it must be regarded as an α-dextrose ether of acetonecyanohydrin. Accepting Fischer's generalisation, it seems clear from these data that flax, cassava, and the lima bean contain at least two glucosido-

lytic enzymes, the one of the emulsin or β-type, the other of the maltase or α-type, and that it is the latter to which the decomposition of phaseolunatin is due, since this glucoside is derived from α-dextrose.

April 18.—"The Fermentation of Glucosides by Bacteria of the Typhoid-coli Group and the Acquisition of New Fermenting Powers by *Bacillus dysenteriae* and other Micro-organisms." Preliminary communication. By F. W. **Twort.** Communicated by Dr. Leonard Hill, F.R.S.

(1) A large number of glucosides may be fermented by many members of the typhoid-coli group of bacteria. The fermentations vary with the micro-organism tested, and the variations are as marked inside each subgroup of bacteria as between adjacent subgroups.

(2) The sugar-fermenting powers of an organism may be artificially changed by growing the said organism for a succession of generations in media containing a sugar which at the commencement of the experiment it was unable to ferment.

By this means a pathogenic organism may be altered until it gives fermentative reactions characteristic of a non-pathogenic member of its group. It is possible, indeed, that pathogenic organisms in the typhoid-coli group may so alter their characters that they become unrecognisable when growing for some time outside the body in soil, water, &c. If this is so, it might partly account for the difficulty experienced in isolating *B. typhosus* from these situations.

It also seems possible that a non-pathogenic organism may lose its fermenting powers and become pathogenic should it find a suitable medium such as the alimentary canal, and regain its old characters when outside the body. This is, however, only a suggestion, which at present is in no way proved.

In view of the results obtained with the typhoid-coli group of organisms, it seems quite possible that other organisms may show similar changes, and that the fermentation tests worked out by Mervyn Gordon for the Streptococci may also be inconstant, if the same means of experimentation are employed.

May 2.—"On the Variation of the Pressure developed during the Explosion of Cordite in Closed Vessels." By Prof. C. H. **Lees,** F.R.S., and J. E. **Petavel.**

(1) As most of the modern explosives used in ballistics follow the law of combustion by parallel surfaces, it appears from the results described that their properties may be defined by four constants, which may be determined without difficulty by direct experiment.

(2) The constants b and c (of formula 1) fix the maximum pressure which will be attained under any given charging density. The constants a_0 and a (of formulæ 4 and 9) measure the rate of combustion and determine the time which elapses between the ignition of the charge and the development of the maximum pressure.

(3) When the explosive is made up in a cylindrical form, the time occupied by an explosion for the same gravimetric density is proportional to the diameter of the cylinder.

(4) The rate of increase of the pressure is most rapid when about two-thirds of the maximum pressure has been attained.

(5) The maximum rate of rise of pressure per second is equal approximately to $1{\cdot}54a$ into the square of the maximum pressure in atmospheres divided by the diameter of the cordite in centimetres.

(6) When the explosion is fired under a high gravimetric density, the "effective" time of combustion may for practical purposes be taken as equal to the time required if the combustion proceeded always at its maximum rate.

For cordite Mark I. this time is given by $T=36\,D/P$ if the diameter D is measured in centimetres and the maximum pressure P in atmospheres, or $T=0{\cdot}6\,D/P$ if the units are inches and tons per square inch.

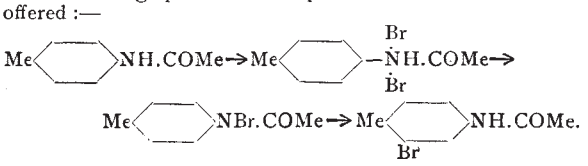
Throughout the above investigation the cooling effect of the walls of the containing vessel during the combustion was taken as small enough to be neglected.

Challenger Society, May 3.—Mr. L. W. Byrne in the chair.—Mr. **Byrne** exhibited and made remarks upon rare deep-water fish of the N.E. Atlantic obtained from various sources.—Dr. **Fowler** exhibited a new horizontal closing tow-net which he had designed for use at different depths down to about 100 fathoms, pointing out that recent work had shown the necessity for a more precise knowledge of the depth at which an organism was captured in the upper zones than was furnished by the ordinary method of open tow-nets of the common surface pattern.—Dr. **Fowler** also exhibited a new "constant resistance" net, designed to avoid damage to delicate organisms collected for morphological or embryological study; it was so arranged that the area of the mouth automatically diminishes in proportion as the resistance (pace) increases.

Royal Meteorological Society, May 15.—Dr. H. R. Mill, president, in the chair.—The standard rain gauge, with notes on other forms: Dr. **Mill.** When the late Mr. Symons founded the British Rainfall Organisation forty-seven years ago, such observations as were being carried on were made with rain gauges of the most varied patterns, set up at any height from the ground that suggested itself to the observer, and read irregularly at almost any hour of the day or night. Since that time there has been a steady approximation to uniformity, and now the greater number of rain gauges in use are of a few definite patterns, set, for the most part, at nearly the same height above the ground. Dr. Mill strongly recommends the Snowdon pattern rain gauge, which is 5 inches in diameter, has a vertical rim to the funnel of 4 inches, and has an inner can and also a bottle. He does not recommend rain gauges with shallow funnels, nor the Howard and Glaisher patterns.—Account of a captive balloon being struck by lightning at Farnborough during a thunderstorm on April 11: Colonel J. E. **Capper.** The lightning flash appeared to travel along the wire until it reached the wagon; then a sudden bright light appeared and ran right up the wire into the clouds in which the balloon was hidden. The wire was fused, being burnt entirely away where it first touched the iron pulleys which guide the wire when running out. One side of the balloon and net was burnt, probably owing to the hydrogen catching fire, but the other side was uninjured.—A remarkable excavation made by lightning in peat earth on August 2 or 3, 1906, in a moorland district of Northumberland: Prof. A. **Herschel.**—Apparatus for measuring fog densities: J. W. **Lovibond.**

Chemical Society, May 16.—Prof. R. Meldola, F.R.S., past-president, in the chair.—The relation between the crystalline form and the chemical constitution of simple inorganic substances: W. **Barlow** and W. J. **Pope.** Close packed, homogeneous assemblages made up of two or more kinds of spheres of nearly the same size must approximate in marshalling to holohedral cubic symmetry or holohedral hexagonal symmetry with the axial ratio $a:c=1:0{\cdot}8165$. All the known crystalline forms exhibited by the elements can be interpreted in the light of the above geometrical principles, which also explain how binary compounds composed of two elements of the same valency crystallise in the cubic system and how silver iodide crystallises in the hexagonal system. The axial ratios of CsI_3 and RbI_3 are also in accordance with the geometrical principles stated above.—Experimental investigation into the process of dyeing: J. **Hübner.** It is shown that the absorption of dyes by cotton and wool is similar in many points to the absorption of these colours by inorganic materials such as graphite and charcoal, and hence it is deduced that dyeing is a purely physical phenomenon.—Esterification constants of substituted-acrylic acids, part ii.: J. J. **Sudborough** and E. R. **Thomas.** The results illustrate the retarding effect which a double bond in the $\alpha\beta$ position has on the velocity of esterification.—The addition of bromine to the α- and β-chloro- and bromo-cinnamic acids and their methyl esters: J. J. **Sudborough** and G. **Williams.**—The addition of bromine to unsaturated compounds, part i.: J. J. **Sudborough** and J. **Thomas.**—Separation of cadmium from zinc as sulphide in the presence of trichloroacetic acid: J. J. **Fox.** For the complete separation of cadmium and zinc by this means two precipitations are desirable, but this is unnecessary when the proportions of cadmium and zinc are about equal, or when cadmium is present in excess.—The mechanism of bromination of acylamino-compounds. Preliminary notice: J. B. **Cohen** and W. E. **Cross.** In the ordinary process of brominating acylamino-

compounds in acetic acid solution, the crystalline product, which is first formed, yields, on pouring it into water, the nuclear brominated compound. This intermediate compound has been isolated in the case of aceto-*p*-toluidide. The following provisional explanation of the action is offered :—



—Mixed semi-ortho-oxalic compounds : G. D. **Lander.** The amide chlorides of methyl and ethyl oxanilates are stable below 100°. On decomposition by heat they pass, by loss of hydrogen chloride, into the imide chlorides, which are further resolved into alkyl chloride, carbon monoxide, and phenylcyanate.—Some derivatives of γ-pyranol allied to certain derivatives of brazilein and hæmatein. Preliminary communication : W. H. **Perkin,** jun., and R. **Robinson.** *o*-Hydroxybenzaldehyde and its derivatives condense with certain acetophenone or hydrindone derivatives to form derivatives of γ-pyranol. Thus β-resorcylaldehyde and acetophenone condense readily in presence of hydrogen chloride to give 7-hydroxy-2-phenyl-1 : 4-benzopyranol hydrochloride. With 1-hydrindone, 7-hydroxy-2 : 3-indeno-1 : 4-benzopyranol hydrochloride is formed. β-Resorcylaldehyde and 5 : 6-dimethoxy-1-hydrindone are condensed by hydrogen chloride in methyl-alcoholic solution to give 7-hydroxy-5 : 6-dimethoxy-2 : 3-indeno-1 : 4-benzopyranol hydrochloride. The substances thus produced may also be obtained by the action of alcoholic hydrochloric acid on the *o*-hydroxybenzylidene-1-hydrindones, and, conversely, the latter are again produced from the pyranols by the action of alcoholic potash.—Arsenic di-oxide : J. T. **Hewitt** and T. F. **Winmill.** The authors have examined Bamberger and Philipp's arsenic di-iodide, and find that it has the formula As_2I_4. Pyridine decomposes it immediately, liberating arsenic.—The formation and reactions of imino-compounds, part iv., the formation of 1 : 4-naphthylenediamine from ethyl γ-imino-α-cyano-γ-phenylbutyrate : J. F. **Thorpe.**—Mercury derivatives of pseudo-acids containing the group .CO.NH. : S. J. M. **Auld.** Unlike cyanuric acid, which forms two isomeric mercuric salts, all the pseudo-acids containing the group .CO.NH. examined have given only one derivative, in all cases an N-salt containing the group .CO.Nhg.—The influence of substitution in the nucleus on the rate of oxidation of the side-chain, iii., oxidation of the nitro- and chloronitro-derivatives of toluene : J. B. **Cohen** and H. J. **Hodsman.** —The reducibility of magnesia by carbon. Preliminary note : R. E. **Slade.** The two methods, which furnished a positive result, confirm the experiments of Lebeau, but whereas this author considers that the reduction only occurs at or above the boiling point of magnesia when the vapours come in contact, the present research seems to show that the reaction can take place at temperatures below the melting point of this oxide.—The reaction between organo-magnesium halides and nitro-compounds. Preliminary note : R. H. **Pickard** and J. **Kenyon.** Aromatic nitro-compounds react very vigorously with an organo-magnesium halide in ethereal solution.—A method for the determination of the equilibrium in aqueous solutions of amines, pseudo-acids and bases and lactones : T. S. **Moore.**—The "true" "ionisation constants" and the "hydration constants" of piperidine, ammonia, and triethylamine : T. S. **Moore.**

Institution of Mining and Metallurgy, May 16.—Prof. William Gowland, president, in the chair.—Siberian mines and mining conditions : A. L. **Simon.** A description of the mines and mining conditions more particularly in the province of Tomsk, the Ural and Orenburg districts, and the Kirghese Steppe. Beginning with a brief historical note, the paper dealt with climate, travelling conditions, the Russian system of weights and measures, mining laws and administration, the methods adopted in applying for claims, prospecting, opening out and working iron, copper and gold mines in Siberia, with details of costs and labour conditions.—Notes on a modern stamp mill : Gilmour E. **Brown.** A series of notes on various details of two stamp mills, compiled from personal experience and observation, containing figures relative to wear, cost of renewal, and the general efficiency of different component parts of the installation.—The use of zinc in assaying copper matte, &c. : Donald M. **Levy.** A description of results obtained by the employment of zinc for separating copper from the solution when assaying mattes, the copper and iron contents of which were both to be determined. The method described involves the use of only one reagent for the two operations. Figures were given of a series of comparative experiments showing the success of the method in practice. —A method of leaching gold ore tailings : R. S. **Botsford.** A brief note showing how, by slow and careful upward leaching, and continuous drawing off from below with the addition of fresh solution above the ore, a material saving was effected in the time occupied by the leaching process.

PARIS.

Academy of Sciences, May 27.—M. Henri Becquerel in the chair.—The suspended collimator of M. Schwarzschild : G. **Lippmann.** The arrangement described by the author in a recent number of the *Comptes rendus* was anticipated by M. Schwartzschild in 1904.—The flora and the relative levels of the coal borings of Meurthe-et-Moselle : R. **Zeiller.** More than 10,000 specimens of fossil impressions of plants have been obtained from these trial borings. These represent 145 species, some of which are new, and of which a detailed account is given.—The positions of the datum stars concerning the planet Eros deduced from the Toulouse negatives : B. **Baillaud.** An examination of the causes of the differences between the results of the reduction already published and those obtained from the same plates by Mr. Hinks.—The absence of polarisation of the prominences : P. **Salet.** Light from the edges of the sun and of the prominences is not polarised, and hence there is a contradiction between the theories of Schmidt and Julius and Fresnel's theory of polarisation.—Applications of a theorem of approximate convergence : Ernst **Fischer.**—The viscosity of fluids : Marcel **Brillouin.** A tentative formula for the viscosity of fluids is given and applied to the case of carbon dioxide, the viscosity of which has been studied experimentally both in the liquid and gaseous states.—A new property of gases issuing from flames : Maurice **de Broglie.** The gases from flames contain centres electrically neuter, possessing the properties of taking a charge under the influence of the radium radiation or Röntgen rays, and of being arrested by an ordinary cotton-wool filter and destroyed by heat. Gases containing these centres, after washing in dilute saline solutions, acquire a higher ionisation.—The sensibility of the electrostatic telephone : Henri **Abraham.**—Measurements of wave-lengths in the iron spectrum for the establishment of a system of spectroscopic standards : H. **Buisson** and Ch. **Fabry.** A completion of results already published by measurements in the ultra-violet.—Some double sulphites of hypovanadic acid : Gustave **Gain.** The alkaline bases possess the property of combining easily with hypovanadic acid in presence of sulphurous acid, giving well-defined double sulphites. Details are given of the compounds obtained with potassium, ammonium, rubidium, cæsium, thallium, sodium, and lithium.—Lead selenide : H. **Pélabon.** A study of the fusibility curves of mixtures of selenium and lead.—The methyl ethers of allyl and propargyl carbinols : M. **Lespieau.** A study of the action of allyl bromide and monochlormethyl ether on magnesium. The resulting mixture of di-allyl and the ether

$$CH_2{=}CH{-}CH_2{-}CH_2.O.CH_3$$

could not be separated by fractional distillation, but the separation was easily effected after converting into the bromine addition products.—A new crystallised principle from kola : M. **Goris.** Hitherto only two definite compounds, caffeine and theobromine, have been isolated from kola ; the author describes a method of treatment by means of which a third substance can be obtained, kolatine, a phenolic substance of the formula $C_8H_{10}O_4$.—The ferment of the fig (*Ficus carica*) : A. **Briot.** The coagulation of fresh milk by extract of fig is retarded or prevented by the existence in the milk of an antiferment. Heat destroys this antiferment, and hence boiled milk is more

easily coagulated than fresh milk by this ferment.—The measurement of the mechanical work furnished by oxen of the Aubrac breed: M. **Ringelmann.**—The frontal gibbosity in fishes of the genus Ptychochromis: Jacques **Pellegrin.**—The duration of the larval life of Eucyphotes: H. **Coutière.**—The results furnished by the complete realisation of the physiological conditions which should be satisfied by the respiratory apparatus to permit man staying and working without danger in irrespirable atmospheres: J. **Tissot.** The conditions necessary are laid down in the following order, from the points of view of mechanics, chemistry, security, and efficiency.—The work developed during phonation: M. **Marage.** The work is measured by VH, where V is the volume of air which escapes from the lungs in a given time, and H its pressure. The author was able to make measurements of these magnitudes in two subjects, one with an artificial larynx, the other with normal vocal cords and with a tracheal cannula. For public speaking, the study of breathing is of the first importance; more energy is expended in speaking in a low pitch than a high one.—Researches on the action of waters containing sulphur compounds in the mercurial treatment: A. **Desmoulières** and A. **Chatin.** It is now well known that syphilitic patients under mercurial treatment who are taking sulphurous waters can tolerate doses of mercury compounds four or five times as great as those permissible without the use of such waters. This tolerance has been usually attributed to the precipitation of the mercury as sulphide, an insoluble form, but according to the authors' researches this is not the case. The effect is produced by increasing the solvent power of the blood serum with respect to the mercury albuminates.—Contribution to the study of the oscillations of the coast line in the Bay of Callao: P. **Berthon.**—The volcanoes of the Logudoro and Campo d'Ozieri, Sardinia: G. **Deprat.**—The dômes of the Coal-measures in French Lorraine: J. **Bergeron.**—The exploration of the free atmosphere above the Arctic regions: M. **Hergesell.**—A new theory of anthelia, paranthelia, and the white halos of Bouguer and Helvetius: Louis **Besson.**

DIARY OF SOCIETIES.

THURSDAY, JUNE 6.

ROYAL SOCIETY, at 4.30.—On the Two Modes of Condensation of Water Vapour on Glass Surfaces, and their Analogy with James Thomson's Curve of Transition from Gas to Liquid: Prof. F. T. Trouton, F.R.S.—The Mechanical Effects of Canal Rays: A. A. Campbell Swinton.—On the Velocity of Rotation of the Electric Discharge in Gases at Low Pressures in a Radial Magnetic Field: Prof. H. A. Wilson, F.R.S., and G. H. Martyn.—The Osmotic Pressure of Compressible Solutions of any Degree of Concentration: A. W. Porter.—The Distribution of Blue and Violet Light in the Corona on August 30, 1905, as derived from Photographs taken at Kalaa-es-Senam, Tunis: Prof. L. Becker.

ROYAL INSTITUTION, at 3.—Chemical Progress—Works of Berthelot, Mendelé-ff, and Moissan: Sir James Dewar, F.R.S.

LINNEAN SOCIETY, at 8.—Contributions to our Knowledge of the New Zealand Holothurians: Prof. A. Dendy and E. Hindle.—Observations on Australasian Polyclads: Prof. W. A. Haswell.—Report on the Marine Fishes collected by Mr. J. Stanley Gardiner in the Indian Ocean: C. Tate Regan.—The Lithothamnia of the *Sealark* Expedition: M. Foslie. Notes sur les Ixodidæ recueillis dans les îles de l'Océan Indien, par M. J. Stanley Gardiner: Prof. L. G. Neumann.—*Exhibitions: Orobanche Ritro* and some New Varieties of Plants from the Channel Islands: G. Claridge Druce.

CHEMICAL SOCIETY, at 8.30.—The Relation between Absorption Spectra and Chemical Constitution, Part vii., Pyridine and some of its Derivatives: F. Baker and E. C. C. Baly.—The Interaction of Methylene Chloride and the Sodium Derivative of Ethyl Malonate: F. Tutin.—Molecular Weight of β-Naphthol in Solution in Solid Naphthalene: E. P. Perman and J. H. Davies.—Synthesis of Hexatriene Derivatives, Preliminary Notice: I. Smedley.—The Constitution of the Diazo-Compounds: J. C. Cain.—*p*-Cresol Sulphoxide and Sulphide: S. Smiles and T. P. Hilditch.—*p*-Dioxyphenylsulphoxide: S. Smiles and A. W. Bain.—Coloured Azo-derivatives of 1: 3-Diphenylbarbituric Acid. Dynamic Isomerism among the Hydrazones of 1: 3-Diphenylalloxan: M. A. Whiteley.—Dibromoaminoazobenzene: J. T. Hewitt and N. Walker.

RÖNTGEN SOCIETY, at 8.15.—Some Recent Investigations in Connection with Crookes' Tubes: A. A. Campbell Swinton.

FRIDAY, JUNE 7.

ROYAL INSTITUTION, at 9.—Studies in High Vacua and Helium at Low Temperatures: Sir James Dewar, F.R.S.

GEOLOGISTS' ASSOCIATION, at 8.—The Chalk of Surrey, Part ii., The Western Area: G. W. Young.

MALACOLOGICAL SOCIETY, at 8.—Description of a New Species of Clathurella, probably from Ceylon: H. B. Preston.—Nudibranchs from New Zealand and the Falkland Islands: Sir Charles Eliot.—Note on the Name "Bourcieria": E. R. Sykes.—Description of Two New Species of Australian Helicoids, and Note on the Presence of a Double Wall in some Species of the Diaphora Group of Ennea: H. C. Fulton.

SATURDAY, JUNE 8.

ROYAL INSTITUTION, at 3.—The Contest between Guns and Armour: Sir William H. White, K.C.B., F.R.S.

MONDAY, JUNE 10.

ROYAL GEOGRAPHICAL SOCIETY, at 8.45.—Oceanic Circulation: Dr. Otto Pettersson.

TUESDAY, JUNE 11.

MINERALOGICAL SOCIETY, at 8.—Hamlinite from the Binnenthal: H. L. Bowman.—Note on Faceted Beads of Zinc: T. V. Barker.—On Chlormanganokalite: Dr. H. J. Johnston-Lavis and L. J. Spencer.

THURSDAY, JUNE 13.

ROYAL SOCIETY, at 4.30.—*Probable Papers:* Some Points in the Development of *Ophiothrix fragilis*: Prof. E. W. MacBride, F.R.S.—On Certain Phenomena of Inactivation and of Inhibition exhibited by Precipitin Antisera: D. A. Welsh and H. G. Chapman.—The Inhibitory Action upon Subsequent Phagocytosis exerted on Active Normal Serum by Inactive Normal Serum through which Bacilli have been passed: J. C. G. Ledingham.—*Miadesmia membranacea*, Bertrand; a New Palæozoic Lycopod with a Seed-like Structure: Miss M. Benson.—Observations on the Life-history of Leucocytes. Part III.: C. E. Walker.

CHEMICAL SOCIETY (Extra Meeting), at 8.30.—Discourse entitled Some Borderline Problems in Botany: Prof. J. B. Farmer, F.R.S.

MATHEMATICAL SOCIETY, at 5.30.—On Partial Differential Equations of the Second Order: Prof. A. R. Forsyth.

INSTITUTION OF MINING ENGINEERS, at 11 a.m.—Improvements required in Inland Navigation: H. R. de Salis.—Bye-product Coking Plant at Clay Cross: W. B. M. Jackson.—Notes on Bye-product Coke-ovens, with Special Reference to the Koppers Oven: A. V. Kochs.—Bye-product Coke-ovens: P. Schwarz.—Water Supplies by Means of Artesian-bored Tube-wells: H. F. Broadhurst.—Gypsum in Sussex: W. J. Kemp and G. A. Lewis.—The Use of Duplicate Capell Fans: G. M. Capell.

FRIDAY, JUNE 14.

ROYAL INSTITUTION, at 9.

ROYAL ASTRONOMICAL SOCIETY, at 5.

PHYSICAL SOCIETY, at 8.

INSTITUTION OF MINING ENGINEERS, at 10.30 a.m.—The Reform of British Weights and Measures: A. Hopkinson.—The Thick Coal of Warwickshire: J. T. Browne.—Description of the Ozokerite (Mineral Wax) Mine at Boryslaw, Galicia, Austria: D. M. Chambers.—Notes on the Structural Geology of South Africa: Dr. C. Sandberg.—The New Rand Gold-field, Orange River Colony: A. R. Sawyer.—Cast-iron Tubbing: What is the Rational Formula? H. W. G. Halbaum.

CONTENTS.